ATTACHMENT O

Baudhuin Incorporated of Sturgeon Bay, Wisconsin. Bad River Sanitary Survey. Summary of Findings. May 2005 and updates.

Baudhuin Incorporated
engineers • surveyors • soil scientists

55 S. Third Ave • PO Box 105
Sturgeon Bay • WI • 54235-0105
(920)743-8211 • (920)743-8217 Fax
www.baudhuin.com

Bad River Sanitary Survey
Summary of Findings

"FINAL REPORT"

May, 2005

Prepared for:

Bad River Band of the Lake Superior Tribe of Chippewa Indians
Donald Moore Sr., Sr. Tribal Chair
P.O. Box 39
Odanah, WI 54861

Prepared by:

Baudhuin Incorporated
David LaBott, CPSS, Project Soil Scientist
William M. Baudhuin, P.E., Project Engineer
55 South Third Avenue
Sturgeon Bay, WI 54235

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Created 5-27-05

Bad River Sanitary Survey
Summary of Findings

I. *Purpose*

Baudhuin Incorporated was retained by the Bad River Band of the Lake Superior Tribe of Chippewa Indians to conduct a sanitary survey of 117 septic systems. The 117 systems included in this report include 35 systems for the 2002 pilot study.
The purpose of the survey was to determine the following:

A. Evaluate the working condition of the septic systems on tribal lands to protect the groundwater and the environment.
B. Determine code compliance of septic systems to the State of Wisconsin Department of Commerce Standards.
C. Provide data to the Tribe on the overall condition of the septic systems on the Reservation.
D. Determine on-site replacement alternatives for failing as well as non-failing sewage system. This included identifying possible replacement options for existing sites.
E. Provide a Preliminary Opinion of Probable Cost for the repair/replacement of the analyzed on-site wastewater treatment systems.

The Bad River Band of the Lake Superior Tribe of the Chippewa Indians wanted a comprehensive survey that could provide a sound basis for cost-effective and long term affordable solutions for failing septic systems.

II. *Scope*

The sanitary survey included 117 septic systems through out the reservation. The 117 septic systems included all tribal and non-tribal willing landowner participants.

III. *Inspection Team*

Ralph Dashner of the Department of Natural Resources was instrumental in providing Indian Health Department data on the existing systems. He also was a great help in locating and contacting the owners of the systems that were part of the sanitary survey program.

The following Baudhuin Incorporated staff participated in this work effort:

David LaBott,	Certified Professional Soil Scientist Licensed Plumbing Inspector II Master Plumber Restrictive Service Designer
Edwin A. Taylor,	Certified Professional Soil Scientist Designer

William M. Baudhuin, Professional Engineer, Registered Land Surveyor

IV. *Techniques and Methods*

A septic system questionnaire was sent out by the Natural Resources Department to all residents on septic systems within the reservation boundaries. This questionnaire asked questions that would help in the evaluation of their septic systems. A public informational meeting was conducted to explain sanitary survey procedures. Owners were given notice of the Baudhuin Incorporated Inspection Team schedule for visiting their property. An Interim Submittal meeting was held with all interested parties attending. The preliminary findings for the sanitary survey sites were reviewed and discussed in detail.

Teams of one or two people were used to conduct the survey. The inspectors completed a Septic System Inspection Form for each parcel. The inspection form included the following:

A. Owner information
B. Parcel description and location
C. Parcel use
D. System information including type, age, and available tank data
E. Soil information including soil type and estimated depth to periodic saturation.
F. Physical observed evidence of liquid ponding in systems, overflows, surface discharge, and back up into tanks and buildings.
G. Soil profile description for the existing system and replacement options.
H. Site sketch
I. System depth, separation distances and relative elevation over limiting conditions in the soil.

A general overview of each site was conducted to note visible and determinable septic system features and setbacks. A hand augured boring was used to verify soils conditions within the existing system and in possible replacement areas. The depths to limiting condition in the soil or observed ground water were noted for each of the septic systems inspected and for replacement areas.

V. *Soils Information and Characteristics*

Based on USDA Soil Survey data, the primary soils on the Bad River Reservation are the following complexes. Soil complexes are made from 2 or more soil series.

	Complexes	% of Soils on Reservation
1.	Badriver-Sanborg-Odanah	80%
2.	Oronto-Denomie-Gichigami	12%
3.	Vilas-Moquah	6%
4.	Lupton-Tawas	4%

VI. *Findings/Recommendation*

Septic system conditions were grouped into the following seven classifications with Classification 1 being the best condition and Classification 7 being the worst condition:

Classification	Recommendation
1.	System OK, pump out and check tanks and replace if needed.
2.	System OK with mechanical and/or electrical repairs, pump out and check tanks and replace if needed.
3.	Mechanical and/or electrical repairs, system status is OK with conditions
4.	Mechanical and/or electrical repairs, add pretreatment
5.	Rebuild
6.	Rebuild with pretreatment
7.	Abandon/replace

The following table shows the relative number of systems in the above seven categories for the 117 surveyed systems.

Recommendation Summary Totals
(Total Inspections 2002 & 2004)

Classification	Recommendation	Number	%	Cumulative %	Reverse %
1.	System OK, pump out and check tanks and replace if needed.	24	20.51	20.51	99.99
2.	System OK with mechanical and/or electrical repairs, pump out and check tanks and replace if needed.	11	9.40	29.91	79.48
3.	Mechanical and/or electrical repairs, system status is OK with conditions	6	5.13	35.04	70.08
4.	Mechanical and/or electrical repairs, add pretreatment	3	2.56	37.60	64.95
5.	Rebuild	16	13.68	51.28	62.39
6.	Rebuild with pretreatment	3	2.56	53.84	48.71
7.	Abandon/replace	54	46.15	99.99	46.15
	Total	***117***			

Recommendation Summary Totals
(2002) Revised 1-18-05

Classification	Recommendation	Number	%	Cumulative %	Reverse %
1.	System OK, pump out and check tanks and replace if needed.	5	14.29	14.29	99.99
2.	System OK with mechanical and/or electrical repairs, pump out and check tanks and replace if needed.	2	5.71	20.00	85.70
3.	Mechanical and/or electrical repairs, system status is OK with conditions	2	5.71	25.71	79.99
4.	Mechanical and/or electrical repairs, add pretreatment	2	5.71	31.42	74.28
5.	Rebuild	5	14.29	45.71	68.57
6.	Rebuild with pretreatment	2	5.71	51.42	51.28
7.	Abandon/replace	17	48.57	99.99	48.57
	Total	***35***			

Recommendation Summary Totals (2005)

Classification	Recommendation	Number	%	Cumulative %	Reverse %
1.	System OK, pump out and check tanks and replace if needed.	16	12.80	12.80	100.00
1A	System OK, tanks pumped, checked and OK	6	4.80	17.60	87.20
1B	System OK, tanks pumped and need repair and/or replacement	7	5.60	23.20	82.40
2.	System OK with mechanical and/or electrical repairs, pump out and check tanks and replace if needed.	6	4.80	28.00	76.80
2A	System Ok with mechanical and/or electrical repairs, tanks pumped, checked and OK	4	3.20	31.20	72.00
2B	System Ok with mechanical and/or electrical repairs, tanks pumped, and need repair and/or replacement	2	1.60	32.80	68.80
3.	Mechanical and/or electrical repairs, system status is OK with conditions.	2	1.60	34.40	67.20
3A	Mechanical and/or electrical repairs, system status is OK with conditions. Tanks pumped, checked and OK.	4	3.20	37.60	65.60
3B	Mechanical and/or electrical repairs, system status is OK with conditions. Tanks pumped, and need repair and/or replacement.	0			
4.	Mechanical and/or electrical repairs, add pretreatment.	2	1.60	39.20	62.40
4A	Mechanical and/or electrical repairs, add pretreatment. Tanks pumped, checked and OK.	0			
4B	Mechanical and/or electrical repairs, add pretreatment. Tanks pumped, and need repair and/or replacement.	1	.80	40.00	60.80
5.	Rebuild	12	9.60	49.60	60.00
5A	Rebuild, Tanks pumped, checked and OK.	1	.80	50.40	50.40
5B	Rebuild, Tanks pumped, and need repair and/or replacement.	3	2.40	52.80	49.60
6.	Rebuild with pretreatment	2	1.60	54.40	47.20
6A	Rebuild with pretreatment. Tanks pumped, checked and OK.	1	.80	55.20	45.60
6B	Rebuild with pretreatment. Tanks pumped, and need repair and/or replacement.	0			
7.	Abandon/replace	40	32.00	87.20	44.80
7A	Abandon/replace. Tanks pumped, checked and OK.	9	7.20	94.40	12.80
7B	Abandon/replace. Tanks pumped, and need repair and/or replacement.	7	5.60	100.00	5.60
	Total	***125***			